PATENT APPLICATION

IN THE U.S. PATENT AND TRADEMARK OFFICE

April 14, 1998

Applicants : Hidenari YASUI et al

For : PROCESS AND APPARATUS FOR BIOLOGICAL TREATMENT OF AQUEOUS ORGANIC WASTES

Serial No. : 08/309 868 Group : 1302

Filed : September 21, 1994 Examiner: C. Sherrer

Atty. Docket No.: Yanagihara Case 28

Assistant Commissioner for Patents
Washington, D. C. 20231

REPLY BRIEF UNDER 37 CFR 1.193(b)

Sir:

This reply brief is being filed pursuant to the provisions of 37 CFR 1.193(b) and is directed to points of argument made by the Examiner in the Examiner's Answer.

In the Examiner's Answer, the Examiner asserts that the Dorau et al reference shows (1) the removal of a portion of an aerated aqueous suspension from the aeration tank, ozone treatment of the aerated aqueous suspension and the returning of the ozonized aerated aqueous suspension back to the aeration tank or (2) performing ozone treatment on part of the sludge formed from the subjection of the aerated aqueous suspension to solid/liquid separation and the returning of the ozonized part of the concentrated sludge back to the aeration tank for further aerobic biological treatment. The Examiner's position clearly is in error.

First of all, as defined by Claim 11, the aerated aqueous suspension is formed from aqueous organic waste aerated in the presence of a biosludge composed essentially of aerobic microorganisms. In the ozonizating step of the present claims, the aerated aqueous suspension is withdrawn from the aeration tank, ozonized and then recycled back to the aeration tank. In stage 4 of the Dorau et al reference, physical or chemical treatment of concentrates 29/1 and 29/2 are performed. However, these concentrates are <u>not</u> separated sludge or aerated aqueous suspension withdrawn from the aeration tank. These concentrates are

generated from filtrate basins 15/1 and 15/2. The feed to filtrate basin 15/1 is either untreated sewage or biologically purified sewage 11 which is separated from the sludge 10 in a membrane-filtering device 9. The other feed lines entering into the filtrate basins 15/1 and 15/2 are recycle streams from the membrane nano-filter. In Dorau et al, the sludge separated from the membrane filtering device 9 is either returned to the bioreactor as stream 9 or removed from the system as excess sludge 13. Therefore, Appellants once again wish to reiterate that the Dorau et al reference does not show the ozonizating of either aerated aqueous suspension as defined by the present claims or a part of the separated sludge.

On page 8 of the Examiner's Answer, the Examiner seems to be stating that if Appellants assert that the claimed process steps unexpectedly reduce the amount of excess sludge generated during the process, Appellants must admit that the Examiner has made a showing of prima facie obviousness under 35 USC 103. However, what Appellants are asserting is that the Examiner has not made a proper showing of prima facie obviousness under 35 USC 103 as some of the claimed critical process steps are not shown in the references and that the results achieved by the claimed process steps are unexpected. Moreover, it is not necessary in the present situation for the Appellants to present a Declaration Under 37 CFR 1.132 testing the cited prior art in the present situation. Evidence of unobviousness is presented in the present specification in the form of Examples and Comparative Examples and the Comparative Examples are closer to the presently claimed invention than the prior art cited by the Examiner. Appellants assert that the data contained in the present specification establishes the unobviousness of the presently claimed invention over the Comparative Examples, which are closer to the present invention than the references cited by the Examiner.

On page 9 of the Examiner's Answer, the Examiner states that only Claim 3 requires that the pH be adjusted to 5 or lower before the ozonization step. However, Claim 11 clearly requires the ozonizating taking place at a pH of 5 or lower. This means

that the aerated aqueous suspension withdrawn from the aeration tank or a part of the separated sludge are at a pH of 5 or lower when the ozonization step is taking place. Therefore, once again the Examiner's opinion clearly is erroneous. Moreover, all of the secondary references cited by the Examiner only speak to ozone being unstable at higher pHs in environments not related to sewage treatment. The Hei et al reference refers to the decomposition of ozone being substantially enhanced as the pH increases past 6, Berndt et al discloses that ozone in an aqueous solution is more stable at a pH of less than about 9 and Kramer et al states that at a pH greater than 10, ozone is very rapidly destroyed. Figure 16 of the present application shows that when the pH is adjusted to be between 3 and 5 prior to the ozone treatment, a much lower amount of ozone is needed to accomplish the desired oxidation as compared to a pH of 6 which is suggested to be effective in the Hei et al reference. Therefore, the Examiner's comments regarding optimization are felt to be unwarranted, especially in light of the unrelated utilities of the references.

For the reasons discussed above and in the Appellants' Brief on Appeal, it is respectfully submitted that the Examiner's rejection of the present claims clearly is erroneous and should be reversed.

IN TRIPLICATE

Respectfully submitted,

TFC/smd

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